

10/530



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,533	04/06/2005	Kazuyoshi Irioka	10873.1602USWO	4798

53148 7590 02/12/2007
HAMRE, SCHUMANN, MUELLER & LARSON P.C.
P.O. BOX 2902-0902
MINNEAPOLIS, MN 55402

EXAMINER

LARYEA, LAWRENCE N

ART UNIT	PAPER NUMBER
----------	--------------

3768

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/530,533

Applicant(s)

IRIOKA ET AL.

Examiner

Lawrence N. Laryea

Art Unit

3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/06/05 05/08/06</u> | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-7 are objected to because of the following informalities:

Re claim 1, the limitation "its" at line 11 renders the claims indefinite because one cannot be certain what "its" intended to refer to.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Irioka et al (Patent 6551245)** in view of **Moya (Patent 4690150)**.
5. Re claims 1 and 2: **Irioka et al** teaches an ultrasonic probe comprising: an ultrasonic element unit for transmitting and receiving ultrasonic waves; an oscillation mechanism for causing oscillation to the ultrasonic element unit (**See Col. 1, line 31-39**) and a detector for detecting oscillation of the ultrasonic element unit wherein the

Art Unit: 3768

detector detects the oscillation angle and the oscillation origin of the ultrasonic element unit and when the oscillation range of the ultrasonic element unit is divided at the oscillation origin into two regions of a positive region and a negative region, the detector detects in which region of the positive region or the negative region the ultrasonic element unit is located (**See Col. 1, line 45-59, Col. 5, line 9-20, Col. 5, line 27-31, Col. 5, line 43-47 and Col. 5, line 6-25**).

Irioka et al disclose an ultrasonic probe wherein magnetoresistive units measure the oscillation angle and reference positions of the ultrasonic element unit. The ultrasonic element unit does not expressly disclose that a control unit controls the origin return for the ultrasonic element unit basis of the result of the detection by the detector (**See Col. 2, line 42-45, Col. 4, line 20-34**).

Mayo discloses a diagnostic ultrasound apparatus wherein a control unit controls the origin for the ultrasonic element unit basis of the result of the detection by a detector (**See Col. 3, line 65-68 and Col. 4, line 11-15**).

It would have been obvious to one having ordinary skill in the art at the time invention was made to modify the ultrasonic probe of **Irioka et al** wherein a control unit controls the origin for the ultrasonic element unit basis of the result of the detection by the detector similar to that of **Mayo** in order to repeat scanning, reverse the ultrasonic element unit to the reference point (stationary reference) for diagnostic evaluations and avoid undesired movements.

Art Unit: 3768

6. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Irioka et al (Patent 6551245)** in view of **Moya (Patent 4690150)** and further in view of **Miyagawa (Patent 5759155)**.

Irioka et al disclose an ultrasonic probe wherein magnetoresistive units measure the oscillation angle and reference positions of the ultrasonic element unit ultrasonic element unit.

Mayo discloses a diagnostic ultrasound apparatus wherein a control unit controls the origin for the ultrasonic element unit basis of the result of the detection by the detector.

Irioka et al and **Moya** fail to disclose an ultrasound apparatus wherein a slit plate formed in an arc-shape, light source, plurality of photodetectors are used in the medical diagnostic procedure.

Miyagawa disclose an ultrasonic probe comprising a detector where a slit plate oscillates (**See Figures 2 and 7**) together with the ultrasonic element unit and has a first slits (**75a**) and second slits(**75b**) where a light source(**74a**) for radiating light to the slit plate; and a first photodetectors (**40**) and second photodetectors (**85a**) which detect the light emitted from the light source and passed through the slits and converts the detected light into an electric signal and outputs an origin-return signal (**See Col. 10, line 25-40, Col. 10, line 58-67, Col. 11, line 1-7 and Col. 10, line 48-55**) and the slit plate oscillates together with the ultrasonic element unit and has plural second slits aligned at a predetermined pitch concentrically or in an arc-shape about the oscillation axis; a light source for radiating light to the slit plate; and a second photodetector which

Art Unit: 3768

detects the light emitted from the light source and passed through the second slits, converts the detected light into an electric signal and outputs an angle signal (**See Col. 13, line 41-65, Col. 14, line 42-66, Col. 15, line 1-40 and Figures 2-4(b) and 16-19**).

It would have been obvious to one having ordinary skill in the art at the time invention was made to modify the ultrasonic probe of **Irioka et al** wherein a control unit controls the origin for the ultrasonic element unit basis of the result of the detection by the detector similar to that of **Mayo** in order to repeat scanning process, reverse the ultrasonic element unit to the reference point (stationary reference) for diagnostic evaluations and avoid undesired movements.

Further it would have been obvious to one having ordinary skill in the art at the time invention was made to modify the ultrasonic probe of **Irioka et al** wherein a control unit controls the origin for the ultrasonic element unit basis of the result of the detection by the detector similar to that of **Mayo** in order to repeat scanning, reverse the ultrasonic element unit to the reference point (stationary reference) for diagnostic evaluations and avoid undesired movements, and also wherein the detector comprises a plurality of slits, a light source and a plurality of photodetectors which are configured to convert the electrical signal to an angle signal in order to have a highly reliable rotation information for medical diagnostic procedure.

7. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Irioka et al** in view of **Moya** and further in view of **Miyagawa** applied to claims 1-5 above, and in view of **Imade et al (Patent 4880011)**.

Irioka et al, Moya and Miyagawa disclose the invention as claimed, see rejection supra; however the combination does not explicitly teach an ultrasonic probe wherein the detector comprises a magnetic dram which oscillates together with the ultrasonic element unit and has plural magnetic patterns.

Imade et al (Patent 4880011) disclose an ultrasonic probe wherein the detector comprises a magnetic dram (26) which oscillates together with the ultrasonic element unit (27) and has plural magnetic patterns aligned at a predetermined pitch concentrically or in an arc-shape about the oscillation axis; and a magnetoresistive element which detects a magnetic pattern of the magnetic dram converts into an electric signal and outputs an angle signal and the magnetic dram is provided on the oscillation axis which is fixed directly to the ultrasonic element unit (Col. 6, line 13-30, Col. 3, line 39-56, Col. 2, line 45-60 and Figures 2-8).

Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to modify the ultrasonic probe of **Irioka et al, Mayo, Miyagawa** similar to that of **Imade et al** wherein a magnetic dram which oscillates together with the ultrasonic element unit wherein a magnetoresistive element detects a magnetic patterns of the magnetic dram and then converts it into an electric signal and outputs an angle signal in order to have a highly reliable and accurate rotation information for medical diagnostic procedure (See Abstract) as taught by **Imade et al**

8. Also, **Imade et al** teaches an ultrasonic probe comprising: an ultrasonic element unit for transmitting and receiving ultrasonic waves; an oscillation mechanism for causing oscillation to the ultrasonic element unit and a detector for detecting oscillation

Art Unit: 3768

of the ultrasonic element unit wherein the detector detects the oscillation angle and the oscillation origin of the ultrasonic element unit and when the oscillation range of the ultrasonic element unit is divided at the oscillation origin into two regions of a positive region and a negative region (**Col. 3, line 39-49 and Figures 1-8 of Imade et al**).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Miyagawa (Patent 5088495) discloses a magnetoresistive element with an arc type magnetic element to sense angular rotation.

Matzuk (Patent 4399703) discloses an ultrasonic probe wherein an oscillating scanner reverse to a reference point such as for a stationary reference.

Green (Patent 4141347) discloses an ultrasonic probe wherein two sensors of optical type are configured to be used for detect (track) reference and angle signals.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence N. Laryea whose telephone number is 571-272-9060. The examiner can normally be reached on 9:30 a.m.-5:30 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eleni Mantis-Mercader can be reached on 571-272-4740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3768

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LNL


ELENI MANOLIS MERCADER
SUPERVISOR, PATENT EXAMINER